

Qualification	Team Formation	Game Method	Robot Condition	Robot Form
Elementary~ High School	1 person (robot) per team	Tournament	Pre-built	Autonomous Mobility

1. Competition Summary

The Box Transfer is a competition to move the suggested box to a designated place by sorting the boxes. This category requires a deep knowledge about sensors and the processing SW algorithm to distinguish the box.

2. Robot Regulation

A. Robot Type

- i. Only skill aptitude after-school products are permitted for this category. (Product info attached)
- ii. Use of mixed parts within the same manufacturer is permitted. Exception, only products used in after school are permitted. (For example: ROBOTIS DREAM part + ROBOTIS PREMIUM part – AX-12A).
- iii. The number of parts used in the robot should not exceed the total number of parts in the relative kit.

For example:

Unacceptable item : ROBOTIS DREAM product + ROBOTIS DREAM product,

Acceptable item : ROBOTIS DREAM product + ROBOTIS SMART product)

B. Robot Components

- i. Robots must be pre-built to participate in the competition.
- ii. Robots may be built at the stadium, but a location or time will not be set aside for this.
- iii. There is no restriction to the robot's size but it must not interfere with the game operation.
- iv. There is not restriction to the robot's weight or movement method.
- v. Robots should be autonomous and are prohibited from using any other communication devices.
- i. The power supply in the kit should not be customized or modified and must be used as it originally is supplied by the manufacturer. (For example, commercially available Lithium AA batteries are permitted, but modifying the case in parallel or series format to increase voltage is prohibited.)

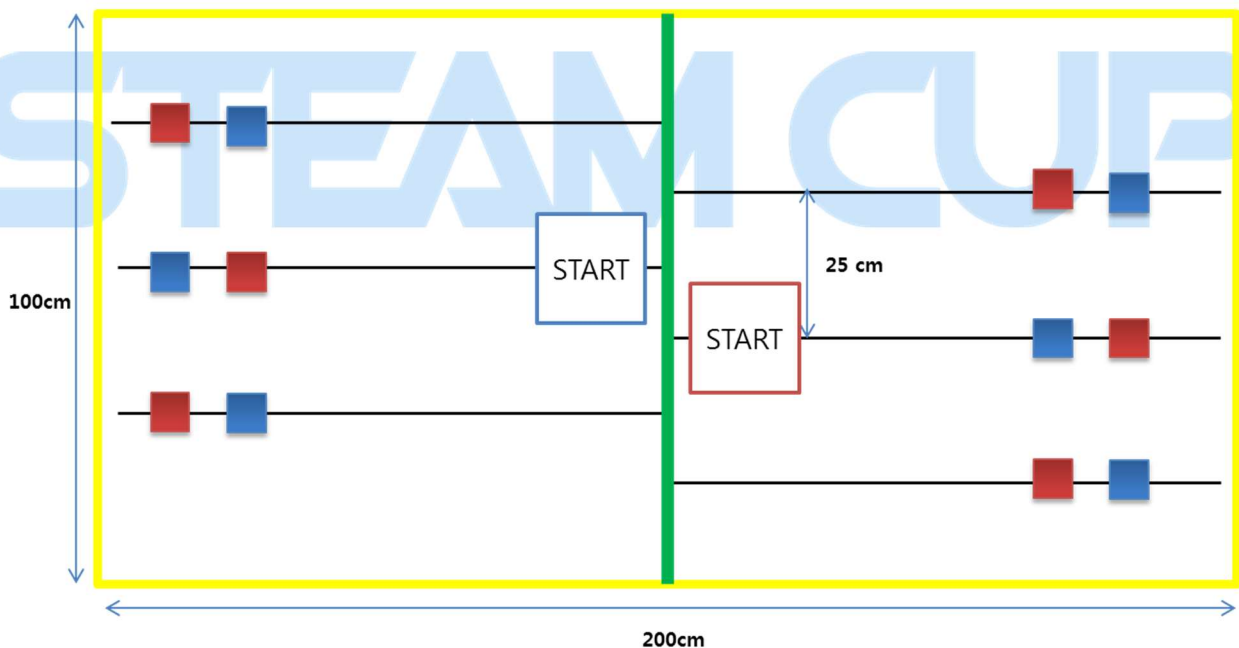
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- vii. If A or B B(iii, iv, v, vi) is violated, robots may be modified at the stadium but should not interfere with the game operation. The team will be disqualified if not ready in time.

3. Arena Regulations

A. Arena Structure

- i. The arena consists of a yellow and green wall as shown in the image below. The yellow wall is to prevent the robot from moving away from the arena, and the green wall is to separate the arenas.
The height of the yellow wall is 8cm, and the green wall is 5cm.
(Marginal error should be within $\pm 10\%$.)
- ii. A black tape (insulation tape) is taped to the floor to help the robot move as shown in the figure below.
- iii. The START displayed in the figure is shown for the purpose understanding, and is not separately displayed on the actual arena floor.

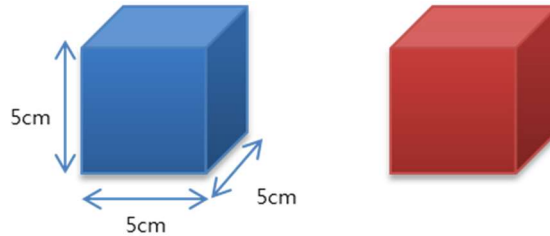


B. Arena Adjuncts

- i. Boxes are placed on each side of the arena floor for the teams to move onto the opponent's side. The size of the boxes are alike but the colors are divided into blue and red.
- ii. The box color for each team to transfer will be announced on the day of the competition.
- iii. The box used for the competition is a cube shape made of sponge with dimensions of

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5cm X 5cm X 5cm and weighs 7g like the figure shown below. (Marginal error should be within $\pm 10\%$.)



C. START

- i. Robots should start and be positioned in the START location and face in the direction of the box.
- ii. With the committee's START sign, team may turn on the robot's power switch just once (sensors should face the sky). In case the robot does not move due to a participant's mistake, the robot can be re-operated, but the game recording time continues. (However, if the robot moves even a bit, team may not touch the robot. Failure to comply will lead to disqualification.)
- iii. No other items, other than the robot, are allowed during the competition.

4. Game Method

A. Competition

- i. The team that transfers the most boxes over to the opponent's side during the given time wins.
- ii. Only randomly selected colored boxes must be set in the opponent's side. Placing other boxes will result in point deduction.
- iii. The teams are given one try with a duration of 3 minutes. The game ends when all objects are transferred over to the opponent's team, when a robot does not function properly, and when a team withdraws.
- iv. This is a tournament style 1:1 competition. A team may win by draw, and a re-draw may be carried out for smooth operation.
- v. Once the box color is determined and the color is changed, time will be given to modify your program. However, when the location of the boxes change right before the game, no additional time will be given for program modification.

If the location of the box changes, there will be no change to the 6 pieces of box placed on each side of the arena, but the ratio of the number of the red and blue boxes may vary. (For example: Your side of the arena can have 2 red boxes and 4 blue boxes.)

B. Scoring Method

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- i. Teams must use a color sensor, and the team with the most transferred boxes wins the game.
- ii. After the game if it is a tie, one box will be placed on the center black line and the robot that transfers the box first wins the game.
- iii. Transferring the correct colored box over to opponent's side gives you 1 point, but if you transfer your colored box, 2 points is deducted.
- iv. Points are not given for boxes transferred to the opponent's side and placed on the green wall (border wall). Boxes should be placed on the opponent's floor to gain points. Same applies for transferring your box by mistake. All boxes must be properly placed on the floor to gain or deduct points.
- v. After the game, the judge can check whether the color sensor is used by directly pressing the power switch on the robot. (If the color sensor is not used, the turn is disqualified and the opponent robot wins.)
- vi. The points for processing the boxes are processed as follows:

Category		Red Box Processed	Blue Box Processed	Points	Rank
Game A	Red	3(+3pts)	1(-2pts)	1	-
	Blue	0(0pts)	2(2pts)	2	Winner
Game B	Red	1(+1pts)	0(0pts)	1	Tie
	Blue	1(-2pts)	3(+3pts)	1	Tie

- vii. Teams should not touch their robot without prior approval from the committee. Failure to comply will lead to disqualification.

C. Others

- i. No practice time will be offered before the competition.
- ii. If a robot is damaged in the stadium, you will be responsible unless the opponent was intentional.
- iii. When at standby or amid the game, teams are prohibited from communicating with the leader (including teachers, instructors, parents, and audience) for robot repair or program fixes.
- iv. For matters undisclosed in this regulations, the competition shall proceed according to the decision of the Committee.
- v. Other than the participants, leaders (including teachers, instructors, parents, and audience) cannot object to the competition results. When interfering with the competition due to this, participant can and will be disqualified, and the leader will be asked to leave.
- vi. Other than the Creative Category (submission type) teams cannot participate in other categories at the same time .

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[Attachment 1] Product Information

Company name	Product name	Company name	Product name
ROBOTIS	OLLO / DREAM / SMART	Roborobo	ROBOROBO
Robot Builder	RQ	Robotron	Robotron
KAIMAX	KAI ROBOT	Dream I	PROBO
i-ROBO	iROBOT	Mega Robo Tech	Hanul & Kid

*For those not listed above, the committee will decide whether or not the kit will be accepted.

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